



Powerwheels Clown Car

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SUMMARY

This is a remote-controlled Halloween project. It can squirt water at you, then dry you off with a cordless blower, swing arms out to "grab" the kids that take too much candy, and speak using a walkie-talkie through a PA horn to let them know what the clown is thinking. This project will teach you a broad range of techniques for adding remote control to things and you can use this same setup to control just about anything with a battery-powered motor.

I have a video of it on YouTube:

Step 1 — Steering



- This has always been the most difficult part but I have done enough to know now that a linear actuator is by far the best thing to use for steering. A linear actuator from eBay is about \$40 to \$50 if you look long enough. One with a two-inch stroke will do. From another project I had a Sabertooth 2X25 dual motor driver. One side of the motor controller will control the steering while the other side will control the existing motors on the drive wheels.
- Sabertooth motor controllers are very easy to work with. Wire both drive motors together and screw them into one side of the Sabertooth and then connect the two wires from the linear actuator to the other side of the Sabertooth. Now hook up the signal wires from the Sabertooth to your receiver and you're almost ready. (Hobbypartz.com has a really inexpensive 6-channel 2.4GHz transmitter and receiver.)

Step 2 — Drive Motors



- Wire the Sabertooth's ground terminal (GND) to the battery ground, and take the positive lead of your battery and wire it into a 50-amp switch (cheap from Autozone; \$3.99). Make sure the switch is off and wire the other terminal on the switch to the +V terminal on the Sabertooth. The Sabertooth has a 5v regulator built in so you do not need anything else; merely connect your receiver to the S1, S2, GND and 5v terminals on the back of the Sabertooth. Two servo pigtails are meant to do this easily, the middle wire always being the +5v lead.

Step 3 — Making the clown turn to look at people



- You should now have a driving and turning RC Powerwheels car. If you have a 6-channel remote control, you still have 4 channels left to do anything you can think of. I used one of them to make my clown turn to look at people. (He actually turns to point the Water Pik gun at people). I had a right-angle motor from a surplus store. This is in the picture below and I made a PVC adapter and set-screwed it to the motor shaft. Then I used PVC pipe for the clown's torso and this fits right into the motor shaft adapter. For controlling this I used a Sabertooth 2X10 RC unit.
- (I know you think this is too expensive and it is if this is all you're doing with the components, but I'm sure you will think of other uses. I have used these parts on 25 different projects and just keep rotating them from one thing to another.) Wire this the same way you did the drive motors and wire the power through the main switch as with the Sabertooth 2X25. This way, everything turns off with one switch. I used the rudder channel of my RC controller to turn the clown left and right. The other side of the Sabertooth 2X10 will be used later for the clown's arms.

Step 4 — Water Gun



- Next I added a water pump from a 12-volt sprayer. This is wired directly to the ground of the battery and through the switch, just like the two Sabertooth motor controllers. The output of the pump runs up to a 12-volt solenoid valve on the back of the clown's head. The other side of that runs through the clown's mouth. The solenoid valve's ground wire goes to the battery, and the positive wire (red wire) goes through a relay switch (8-channel buy from eBay). These are great components; you can get an 8-channel relay switch with 8-channel remote control for about \$20.
- The other side of the relay goes to the main battery's positive side. When the relay switch is activated the solenoid valve will open, letting the water pump shoot the water out of the clown's mouth. The pump needs a reservoir of water to pull from, so I used an empty paint can that I could cut a hole in the top of to feed the water hose through.

Step 5 — Grabbing Arms



- Now on to the arms. I used two right-angle gear motors that were surplus from car seat adjusters. They are approximately 100 RPM so I knew they would be very fast with such long arms, but the motors seemed to have enough torque to get them started and really whip. It turned out to be better than I hoped (it hardly ever happens like that). Both of these motors are wired back to the Sabertooth 2X10. I used the throttle channel on my remote to control these. Push the stick forward and they swing out, pull back on the stick and they come back into the parked position.
- One of the hardest parts of making projects like this is to find a way to attach the moving parts to your motor shafts. I used a Dremel tool to grind a flat stop on the motor shafts and used two lock collars to setscrew them to the shaft, then bolted the PVC arms to the collars. To make the pipes conform to the body of the Powerwheels I heated the pipe up with a blowtorch at a single spot and it bent easily. Hold it in place where you want it until it cools.

Step 6 — Cordless Blower



- I put a cordless blower into the Powerwheels to blow air into the kids' faces. I used the existing battery that comes with the blower. Connect a ground terminal to the ground terminal on the cordless blower, connect the positive terminal to one side of a relay on your 8-channel relay switch and then the other side of the relay goes to the cordless blower's terminal. When you close the relay you will turn on the blower. Just make sure to leave the cordless blower's own power switch on.
- It's a little hard to see in the picture but I used a short hose to direct the air from the blower out the front of the windshield of the Powerwheels.

Step 7 — Chomping Teeth



- The chomping teeth on the hood were really easy to make. I put a small hinge on the hood and put a slow-turning (30 RPM) motor inside the hood with a short piece of aluminum channel bolted to the motor output shaft. I wired the motor through the relay switch and when you close the relay the motor starts running and the aluminum channel hits the hood, pushing it up. When the aluminum channel rotates out of the way the hood falls down and the process repeats.
- The teeth are foam insulation from Home Depot and are held in place with some duct tape. With a little paint they start to look like teeth.

Step 8 — LED glowing eyes



- I added LEDs in the clown's eyes to make him seem more creepy. I used some LEDs bought from hobbypartz.com that will take 5-volt input to make them glow. Remember how the Sabertooth motor controllers have built-in 5-volt regulators? Well, simply plug the LEDs into them and they will light up when you turn on the main power switch of the Powerwheels.
- I drilled holes through the clown's eyes and fished the wires through them and all the way down the clown's torso to the receiver. I used more foam to cut out some scary eyes for the car (my artist wife had to help me there) and put LEDs in them as well.

Step 9 — Scary Clown Laugh

- I had a set of walkie-talkies and I kept one with me inside the house and put the other one in the Powerwheels. I used a PA horn bought from eBay several years ago and got a 1/8" stereo plug connector that fits into the output plug of the walkie-talkie.
- I had downloaded several scary laughs to my phone and I would play them through the walkie-talkie to the Powerwheels. This really did seem to work well.

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